

CLAIMS

What is claimed is:

1. An assembly including:
a semiconductor device having opposed peripheral sides, and opposed ends, an active surface in a first horizontal plane, an inactive bottom surface in a second horizontal plane, and a plurality of bond pads located on the active surface of the semiconductor device, a first portion of the plurality of bond pads located adjacent one of the opposed peripheral sides and a second portion of the plurality of bond pads located adjacent another of the opposed peripheral sides; and
a lead frame comprising:
a first plurality of lead fingers extending substantially in the first horizontal plane of the active surface of the semiconductor device, each lead finger of the first plurality of lead fingers terminating adjacent a peripheral side of the opposed peripheral sides of the semiconductor device;
a second plurality of lead fingers extending below the inactive bottom surface of the semiconductor device, each lead finger of the second plurality of lead fingers having a portion thereof extending adjacent an end of the opposed ends of the semiconductor device and terminating adjacent a peripheral side of the opposed peripheral sides of the semiconductor device; and
a die paddle located below the inactive bottom surface of the semiconductor device.
2. The assembly of claim 1, wherein the ends of the first plurality of lead fingers extend past the ends of adjacent lead fingers of the second plurality of lead fingers.
3. The assembly of claim 1, wherein the ends of the second plurality of lead fingers extend past the ends of adjacent lead fingers of the first plurality of lead fingers.
4. The assembly of claim 1, further including:

tape located between the second plurality of lead fingers and the inactive bottom surface of the semiconductor device.

5. The assembly of claim 1, further including:
tape located between the die paddle and the inactive bottom surface of the semiconductor device.

6. The assembly of claim 1, further including:
tape located between the die paddle and the second plurality of lead fingers and the inactive bottom surface of the semiconductor device.

7. The assembly of claim 4, wherein the second plurality of lead fingers are adhesively attached to the tape.

8. The assembly of claim 7, wherein the second plurality of lead fingers are adhesively attached to the tape using thermosetting adhesive.

9. The assembly of claim 4, wherein the semiconductor device is adhesively attached to the tape.

10. The assembly of claim 9, wherein the semiconductor device is adhesively attached to the tape using silver epoxy paste.

11. The assembly of claim 1, further including:
at least one wire bond extending between at least one bond pad of the plurality bond pads located on the active surface of the semiconductor device and at least one lead finger of the first plurality of lead fingers and the second plurality of lead fingers of the lead frame.

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AQ* 12. ~~The assembly of claim 1, wherein the die paddle includes at least one portion thereon extending beyond a longer peripheral side of the opposed peripheral sides and at least~~

another portion thereof extending beyond an end of the opposed ends of the semiconductor device.

13. The assembly of claim 1, wherein the opposed peripheral sides of the semiconductor device and the opposed ends of the semiconductor device are the same length.

14. The assembly of claim 12, further including:
at least one wire bond connecting a portion of the die paddle extending beyond a peripheral side of the opposed peripheral sides and a bond pad of the plurality of bond pads on the active surface of the semiconductor device.

15. The assembly of claim 12, further including:
at least one wire bond connecting a portion of the die paddle extending beyond an end of the opposed ends of the semiconductor device and a bond pad of the plurality of bonds pads on the active surface of the semiconductor device.

16. The assembly of claim 1, further including:
a plastic material encapsulating the semiconductor device and the lead frame.

17. The assembly of claim 1, wherein at least one lead finger of the second plurality of lead fingers includes an offset therein.

18. The assembly of claim 1, wherein the second plurality of lead fingers includes:
at least one lead finger having a portion thereof extending adjacent a portion of a lead finger of the first plurality of lead fingers, a portion thereof extending adjacent an end of the opposed ends of the semiconductor device, a portion extending substantially opposed to an end of the opposed ends of the semiconductor device, and having a portion extending beyond a side of the opposed peripheral sides of the semiconductor device.

19. The assembly of claim 1, wherein the second plurality of lead fingers includes: at least one lead finger having a portion thereof extending adjacent a portion of a lead finger of the first plurality of lead fingers, a portion thereof extending substantially adjacent an end of the opposed ends of the semiconductor device, a portion extending substantially opposed to an end of the opposed ends of the semiconductor device and extending adjacent a portion of the die paddle, and having a portion extending beyond a side of the opposed peripheral sides of the semiconductor device.

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20. ~~A manufacturing method for a lead frame for a semiconductor assembly having a semiconductor device having two opposed peripheral sides, two opposed ends, an active surface in a first horizontal plane, a bottom inactive surface in a second horizontal plane, and a plurality of bond pads located on the active surface of the semiconductor device, a first portion of the plurality of bond pads located adjacent one of the two opposed peripheral sides and a second portion of the plurality of bond pads located adjacent another of the two opposed peripheral sides, said method comprising:~~

~~forming a first plurality of lead fingers extending substantially in the first horizontal plane of the active surface of the semiconductor device, each lead finger of the first plurality of lead fingers terminating in an end located adjacent a peripheral side of the two opposed peripheral sides of the semiconductor device;~~

~~forming a second plurality of lead fingers extending below the bottom inactive surface of the semiconductor device, each lead finger of the second plurality of lead fingers having a portion thereof extending adjacent an end of the opposed ends of the semiconductor device and terminating in an end located adjacent a peripheral side of the two opposed peripheral sides of the semiconductor device, at least one lead finger of the second plurality of lead fingers including a section extending substantially in the first horizontal plane; and~~

~~forming a die paddle.~~

21. The method of claim 20, wherein the ends of the first plurality of lead fingers extend past the ends of adjacent lead fingers of the second plurality of lead fingers.

22. The method of claim 20, wherein the ends of the second plurality of lead fingers extend past the ends of adjacent lead fingers of the first plurality of lead fingers.

23. The method of claim 20, further including the step of:
placing tape on the second plurality of lead fingers.

24. The method of claim 20, further including the step of:
placing tape between the die paddle and the bottom inactive surface of the semiconductor device.

25. The method of claim 20, further including:
placing tape between the die paddle and the second plurality of lead fingers and the bottom inactive surface of the semiconductor device.

26. The method of claim 24, further comprising:
adhesively attaching the second plurality of lead fingers to the tape.

27. The method of claim 26, further comprising:
adhesively attaching the second plurality of lead fingers to the tape using thermosetting adhesive.

28. ~~The method of claim 20, wherein the die paddle includes at least one portion thereon extending beyond a peripheral side of the two opposed peripheral sides and at least another portion thereof extending beyond an end of the opposed ends of the semiconductor device.~~

29. The method of claim 20, wherein the at least one lead finger of the second plurality of lead fingers includes an offset therein.

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~~30. The method of claim 20, wherein the second plurality of lead fingers includes:~~
at least one lead finger having a portion thereof extending adjacent a portion of a lead finger of the first plurality of lead fingers, a portion thereof extending substantially adjacent an end of the opposed ends of the semiconductor device, a portion extending substantially opposed to an end of the opposed ends of the semiconductor device, and having a portion extending beyond a peripheral side of the two opposed peripheral sides of the semiconductor device.

31. The method of claim 20, wherein the second plurality of lead fingers includes:
at least one lead finger having a portion thereof extending adjacent a portion of a lead finger of the first plurality of lead fingers, a portion thereof extending substantially adjacent an end of the opposed ends of the semiconductor device, a portion extending substantially opposed to an end of the opposed ends of the semiconductor device and extending adjacent a portion of the die paddle, and having a portion extending beyond a peripheral side of the two opposed peripheral sides of the semiconductor device.